



Science News-Letter

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ZOOLOGY

Deadly Snakes Now Conquered by Science

By RAYMOND L. DITMARS

Poisons of serpents have attracted the attention of many noted scientists. There is a lure and fascination in such studies. Attending their progress is the realization of contact with a high degree of specialization perfected through the ages, until the snake acquired a pair of hypodermic needles to take the place of teeth in the upper jaw, and glands secreting lethal fluids that have killed a million and more humans.

It is well to check up that latter statement. A million humans bitten and killed by poisonous snakes! "In how long a time?" asks the reader. And the answer is that in fifty years in India alone, statistics point to this appalling number of deaths from snakebite, as the annual average is slightly over twenty thousand each year. Add to this the fatalities from deadly serpents in Africa, where there is a large number of dangerous species; in Australia, where the greater number of the serpents are poisonous; and the vast tropics of Central and South America infested with poisonous snakes. There has been an estimate made (without actual statistics) that from three to five thousand deaths occur from snakebite each year in the American tropics. Statistics gathered by the writer, over a period of several years, and relating entirely to the United States, indicate an annual average of over one hundred deaths.

Immunization Now Possible

Like the history of a number of sinister human maladies, the death rate from snakebite is soon to change, with the application of scientific discoveries to practical methods of understanding and widespread use. The actual start was at the Pasteur Institute, in France, some twenty years ago. Dr. Albert Calmette immunized horses against the

action of cobra venom and obtained a serum for use in India. Unfortunately, the venom of the cobra is particularly rapid in action and the population of India rather slow to appeal for help when bitten. Calmette's discoveries have, however, started research work in many countries and there are now specific serums prepared in various parts of the world.

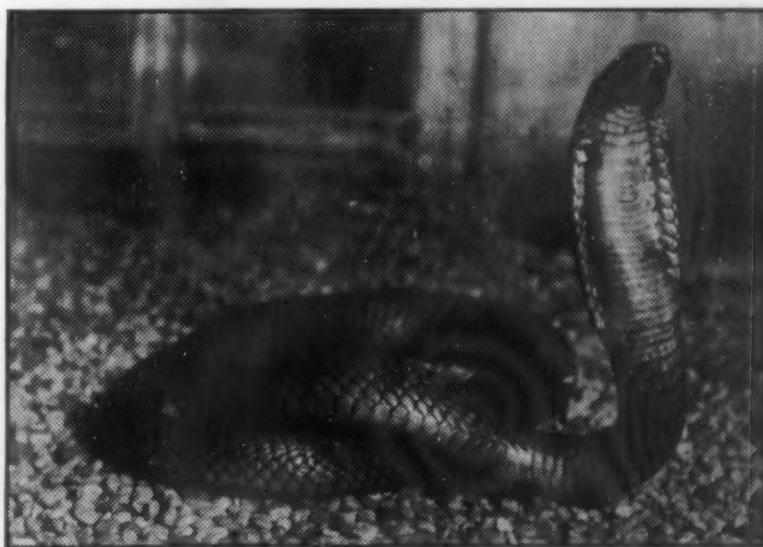
While Calmette must be credited as being the pioneer in the production of a curative serum, following the researches of venom composition by Wier-Mitchell, Noguchi, Langmann and others, the eyes of the scientific world were turned, a little over ten years ago, to Brazil, where was founded for the first time an extensive institution for the production of serum for snakebites. The name of the chief of this novel and modern establishment in the city of Sao Paulo, was soon to become internationally known. Dr. Vital Brazil has set a world-wide pace in producing a remedy, astonishing in results, not only of vast economic im-

portance to the American tropics, but already the means of saving many lives in the United States.

Dr. Brazil demonstrated that for specifically different kinds of snakes, specific serums were needed. He produced a serum for the deadly bushmaster, another for the tropical lancehead snakes, another for the South American rattlesnake, and a fourth grade of serum for the coral snakes. Hundreds of tubes of the rattlesnake serum have gratuitously been tendered for distribution in the United States, and the writer has witnessed the saving of life under remarkable conditions.

The process of preparing the serum is of great interest in demonstrating man's knowledge and control of perfectly natural forces—for the serum is not actually a man-made product, but a mysterious, invisible, non-analytical element or power added to the blood stream, by nature, to completely fortify the animal organization against one of the dead-

(Just turn the page)



THE AFRICAN COBRA, one of the most deadly of serpents. Its cousin, the Indian cobra, kills hundreds of natives yearly.

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Science Conquers Snakes

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liest natural poisons specifically evolved for killing.

How Horses Help

Horses are used for the production of these antivenins. They are first injected with minute quantities of poison, extracted direct from the snake by causing it to bite through a parchment-covered vessel. After steady weeks of treatment, the doses are increased. Nature starts at once to protect her subject against this increasing menace of a natural poison. Keeping a step ahead, nature builds up an immunity that finally enables the horse to withstand what would otherwise be highly dangerous injections, and to finally endure quantities of what would be far in excess of deadly doses. With complete immunity finally established, a blood vessel is tapped and several quarts of blood are obtained. The animal is not injured, nor is the operation attended with anything more than superficial pain. The blood is placed in cylindrical vessels, the heavy red portion settles to the bottom, and the clear, amber-colored or serous portion which forms the top and greater depth, represents the natural-made remedy. This is placed in small ampules, these sealed with a flame, and each represents a dose for snakebite—two or three of them for the bites of very large snakes. The serum is injected into the human with a hypodermic needle.

Serum Acts Like Miracle

When the serum is injected into a human victim, even though grave symptoms have developed and there is great pain and swelling, an immediate immunity takes place. We cannot say that the serpent's poison is neutralized—in fact, we cannot accurately define the working of the

(Continued on page 355)

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Photographs aid in the telling of the week's science.

Great care is taken to keep its editorial content not only *interesting* but *accurate* as to fact and implication.

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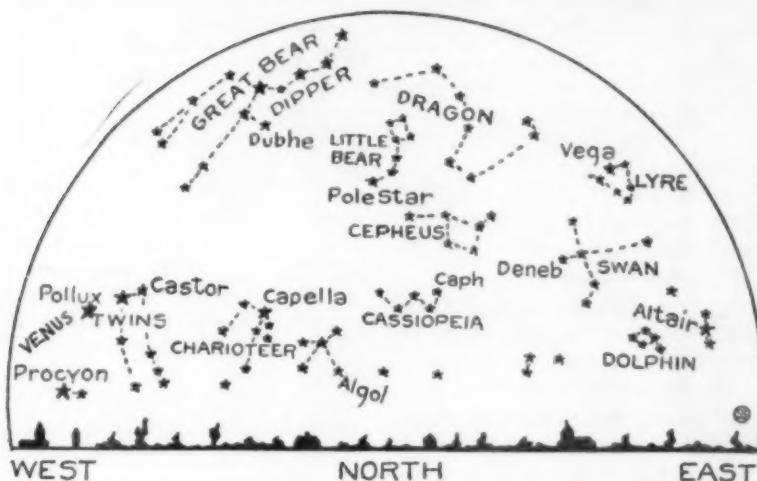
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Eclipse and Comet in June Skies



By JAMES STOKLEY

After a winter and spring in which events of importance in the heavens have been scarce, summer opens with a bang for the astronomer. Scarcely has summer commenced, on June 22 as the sun reaches a point directly overhead at noon on the Tropic of Cancer at 5:22 a. m., Eastern time, when the Pons-Winnecke comet comes within 3,500,000 miles of the earth, closer, so far as we know, than any comet has in the past. The comet is nearest on June 27. And then, on June 29, the most impressive of all heavenly phenomena, a total eclipse of the sun, occurs, which, unfortunately, will not be seen in the United States. But before that time, on the early morning of June 15, the United States will have the opportunity of seeing an eclipse of the moon, which, though not of the scientific importance of a sun eclipse, is always interesting.

Like any eclipse, whether of the sun or moon, these two are due to the fact that the earth and the moon, each illuminated by the sun, cast a shadow into space behind them. As this space is empty, we are not ordinarily aware of this long cone of shadow, but on the fifteenth, when the moon will get into the shadow of the earth, its presence will be evident. An then, fourteen days later, when the moon has gone halfway around the earth in its orbit, its shadow will sweep across the surface of the earth, and people who are in the path of the shadow, and are fortunate enough to have clear weather, will see the sun totally eclipsed.

Every 14 days the sun, the moon

and the earth are almost in line, first at new moon, when the moon is in the middle, and then at full moon, when the earth is between the sun and the moon. But the three bodies are not always exactly in line. Ordinarily when the moon is new, its shadow goes to the north or south of the earth, while at most full moons, the earth's shadow misses falling on the moon. If this were not the case, there would be an eclipse at every new and full moon. However, on June 15 the moon is at what is called a node in its orbit, and then our earthly shadow falls squarely on it. Throughout the United States, the eclipse will be visible.

Eclipse's Time Table

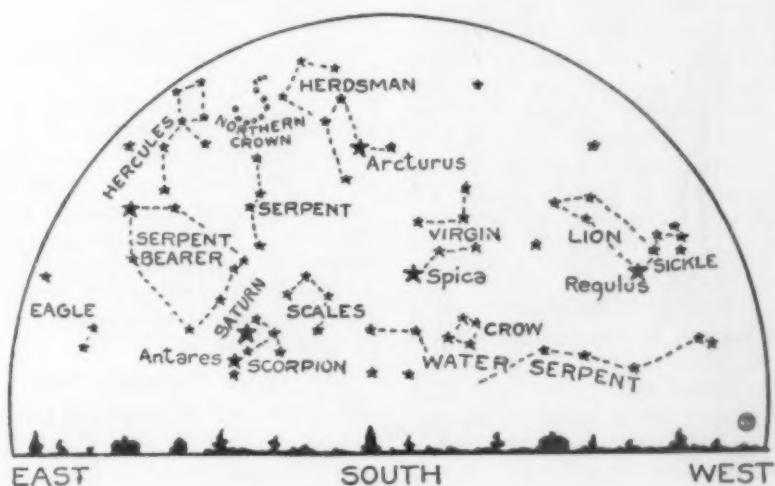
The time table of the eclipse will be as follows: at a little after midnight on the morning of the 15th, 12:34 a. m. Eastern Standard Time,

to be more exact, the moon enters the penumbra, the outer part of the earth's shadow, and in which a person would see the sun partly covered by the dark disc of the earth. This is shown as No. 1 in the small diagram. At 1:43 a. m., Eastern Standard Time, the moon begins to enter the umbra, the dark inner part of the shadow, where an observer would not be able to see the sun at all, because the earth would completely hide it. It is now in the position of No. 2. An hour and a half later, at 3:13 a. m., the moon has completely entered the umbra, and would entirely disappear from view were it not for the earth's atmosphere. We are able to see the sun even after it has set below the horizon, because the layer of air through which its light has to pass, bends the ray of light. A similar bending of light occurs when a ray of light passes from water to air, and makes a straight stick, partly immersed, look bent.

For the same reason, the atmospheric layer bends the sunlight around, and into the shadow cone, but the shorter rays are absorbed. Only the longer rays of the sunlight, the red ones, get through in large quantity, and so the eclipsed moon has a reddish hue. Just how much light is thus refracted, or bent around into the shadow, depends to some extent on the weather on the earth, in the circle over which the sun's rays just graze.

As this eclipse is peculiar in that the moon just barely gets within

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HERE IS A PICTURE OF THE SKY THESE JUNE EVENINGS. Just hold the maps in front of you like a picture. Face north when using the one above. Face south when using the one below.

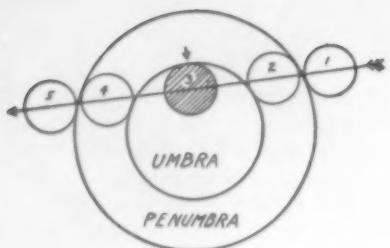


DIAGRAM OF ECLIPSE OF MOON,
June 15, 1927.

June Skies

(Continued from page 351)

the umbra, it offers a good chance to test the effect of atmospheric conditions on the light that passes through it.

The middle of the eclipse, represented by No. 3 in the diagram, comes at 3:24 a. m., Eastern Time. The part of the eclipse moon indicated by the arrow will be just barely within the inner shadow, and will probably be the brightest part of the eclipsed moon. The principal light that illuminates the eclipsed moon, because it is bent the least, will just graze the earth on a line running from Great Slave Lake, in the Northwest Territories of Canada, across Baker Lake, which drains into Chesterfield Inlet, on the west coast of Hudson Bay, to Nova Scotia. Dr. Willard J. Fisher, of the Harvard College Observatory, who makes a study of such matters, has requested any travelers that may be in these regions to note carefully the weather conditions at the moment, 3:24 a. m., Eastern Standard Time, and to report to him.

With the aid of Professor R. Meldrum Stewart, director of the Dominion Observatory at Ottawa, Dr. Fisher has secured the cooperation of the Royal Canadian Mounted Police, Catholic missionaries to the Eskimos, and fur trappers, who will report the weather conditions at the time. Mr. G. A. Wendt, of the Canadian Westinghouse Company, has also arranged to have appeals for such weather observations sent out by radio.

However, as the sun will just be rising, and eclipsed moon just setting in this region, it will not be a good place to observe the eclipse itself. In the northeastern part of the United States, the eclipsed moon will be low in the south. In the southwestern part of the country, it will be in the southeastern part of the sky at the time, and higher than northerners will see it. Observa-

tions made in the United States of the eclipse itself will be compared by Dr. Fisher with weather reports from Canada, in an effort to determine the effect of the earth atmosphere.

As amateurs, with small telescopes, or even with the unaided eye, may be able to make observations that will be missed at the big observatories on account of cloudy weather, Dr. Fisher requests any person who has the opportunity to do so, to report their results to him.

"Such persons," he says, "should note the following points, with instruments of any size, from opera glasses up, and with the naked eye:

"Geographical position, time zone, weather and sky conditions; time of each observation; size and powers, even of opera glasses, for each observation; times of contact of the edge of the moon and the edge of the shadow; description of the edge of the shadow; when and how the red color appears and disappears; spots or blotches apparently going across the moon during eclipse, and so distinct from the ordinary lunar markings; and the visibility of the surface details of the moon, with the naked eye, and a variety of instruments, if possible.

"A special observation, easy to make, and of interest, is of the visibility of the moon's features through colored glass. The easiest to get is blue cobalt glass, but good green glass, or ruby glass, like the photographer uses in his dark room lantern, are more valuable, as they pass light more nearly of a single color. Such observations may also be made either with the naked eye of a telescope."

Results of such observations should be sent to "Lunar Eclipses, Harvard College Observatory, Cambridge, Mass."

Because it is just barely a total eclipse, it is soon over, and at 3:35 a. m., eleven minutes after the middle of the eclipse, the moon begins to emerge from the umbra, or inner shadow. At 5:06 a. m., it has emerged completely, in position No. 4, and at 6:15 it has left even the partly darkened area of the penumbra as shown by No. 5.

Little Scientific Value

Outside of the atmospheric observations mentioned, there is little scientific value to a lunar eclipse, but it is always a striking phenomenon, and will be well worth staying up to the wee, sma' hours of

the morning of June 15 to see. As the moon is partly immersed in the umbra, the round edge of the earth's shadow may be observed on its face—one of the most striking proofs of our globe's rotundity.

Two weeks later, the moon has traveled half-way around in its orbit. It is now, on June 29, between the earth and the sun, or in the phase of new moon, and as it is also at a node, it comes exactly between the two bodies, and we have an eclipse of the sun. The fact that a lunar eclipse must occur at full moon, and a solar one at new moon, and that the two cannot be closer than 14 days apart, has gotten more than one fiction writer into trouble. A prominent English author once had a full moon rising on the night following an eclipse of the sun, while another character in a novel once had the unique experience of seeing an eclipse of the sun and one of the moon on the same day! In this case, fiction was a stranger to truth!

On June 29, then, the shadow of the moon sweeps across the face of the earth, but, unfortunately for Americans, nowhere touches the United States, as it is all over by the time the sun rises on our country. The elliptical shadow, in which the sun is seen totally eclipsed, passes over Wales and England, crossing Liverpool on the Irish Sea, and West Hartlepool on the North Sea, then over Norway, crossing the city of Stavanger, goes northward through the approximate center of the Scandinavian peninsula. Then it crosses the Arctic Ocean, just missing the northern tip of Novaya Zembla, comes to land again to cross the northeastern corner of Siberia, and finally leaves the earth just after crossing the Aleutian Islands.

Norway Best Location

Much of the path of totality over which the shadow passes is rather inaccessible, as in Siberia; the chances for clear weather in England are not very good, as it occurs there just after sunrise, about 5:25 a. m., Greenwich time. Norway seems about the best location, and that is where many of the astronomers who want to observe it are locating their instruments. Of course the English astronomers are making every preparation to watch it, in the hope that it will be clear, but Professor Samuel A. Mitchell, of the University of Virginia, who will head the only American expedition,

(Continued on page 357)

The Death of Matter

By EDWIN E. SLOSSON

"A star is in effect nothing but a huge X-ray apparatus." That is the novel view of stellar structure advocated by Dr. J. H. Jeans, secretary of the Royal Society of London.

The interior of a star, according to his theory, is hotter and heavier than the exterior. At the surface of the sun, for example, the temperature is only about 6,000 degrees centigrade, a temperature attainable in the laboratory. But in the center of the sun the temperature rises to the enormous figure of seventy million degrees. Sirius, the Dog Star, is supposed to be twice as hot as the sun.

The density or specific gravity of the sun as a whole is 1.4 times that of water, and one-fourth that of the earth. But the core of the sun is calculated to have a density of 300, compared with water. This is fourteen times as heavy as the metal platinum. No element on earth comes anywhere near this figure in density. Some 90 or 95 per cent of the mass of the star must then be concentrated in a central sphere of half the radius and one-eighth the volume of the star.

This Dr. Jeans explains on the supposition that the dense interior is composed of heavier atoms than any found on earth. The heaviest atom on earth is uranium, and this is so unwieldy and complex that it is continually breaking down spontaneously into smaller atoms and giving off enormous amounts of energy in the form of rays resembling the X-rays, but of much higher frequency. The radio-active elements, like uranium and radium, "probably represent the last surviving vestiges of more vigorous primeval matter" of the stars which is breaking down into lighter and more permanent elements, such as we see on earth. The youngest and largest stars must consist mostly of such bulky unstable atoms, and these evaporate off in radiation, like the X-rays and other wave lengths, in the course of millions of millions of years, leaving a ball of burnt-out ashes like the cinder on which we live. The evolution of a star is, therefore, from the complex to the simple, which reverses Herbert Spencer's famous definition of evolution.

Matter, according to the modern theory, consists of negative and positive charges of electricity, electrons and protons, in equal numbers,

and when these come into contact the opposite charges are neutralized and annihilated. As Dr. Jeans describes it:

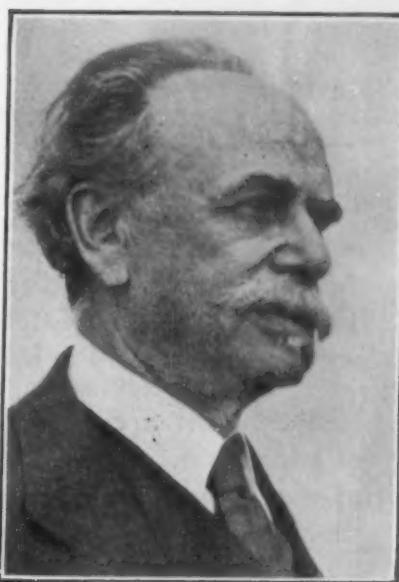
"Throughout a star's interior, electrons and protons must at intervals fall into one another and mutually destroy one another, the energy of their fall being set free as radiation . . . Each proton or atom, as it is annihilated, makes a splash of radiant energy which passes through the star until, after innumerable absorptions and re-emissions, it reaches the star's surface and wanders off into space."

These splashes are similar to the flashes you see when you look through a microscope at luminous radium paint, except that they are thousands of times more powerful. In no way can you get so much energy out of matter as by abolishing it altogether. The heat produced by burning is trivial in comparison. Jeans gives this comparison:

"Whereas the ordinary combustion of a ton of coal provides energy enough to drive an express locomotive for an hour, the annihilation of a ton of coal would provide enough energy for all the heating, lighting, power and transport in Great Britain for a century."

So we are not getting nearly as much heat out of the coal we buy and burn as we could if we knew how to reduce it entirely to immaterial undulations instead of converting it into smoke. A single lump of pea coal would keep our house warm for a lifetime.

But does the matter so transformed into scattered rays of energy ever get materialized again? This is one of the controverted questions of the day. Dr. Arthur Haas of Vienna conceives it possible that matter may be created by a head-on collision of atoms of light and atoms of matter. If an atom (quantum) of light runs into a particle of matter traveling with half the velocity in the opposite direction, the quantum will be turned back on its track and its frequency multiplied three times by the force of the impact. In this way a quantum of light may be converted into a portion of matter. So here we may have the beginning of the building up of matter again out of the errant energy escaped from the disruption of atoms in the star.



FRANZ BOAS

Anthropological Organizer

"The proper study of mankind is man" said Pope many years ago, but not until about two decades ago did the study of mankind, or anthropology, become a science in the United States. Prior to that there had been anthropologists, to be sure, but the study was more of a side line with them. And that it is a science today, rather than a hobby, is due principally to Dr. Boas.

He is the father of one of the two great American schools of anthropology. Mention the name of any of the leading American archaeologists, and you probably name a Harvard man, a student of F. W. Putnam, but if you name an ethnologist, he will have doubtless been a student of Dr. Boas'. In this training that he has given, and the influence he has had, on his fellow ethnologists, he has accomplished a work as great, perhaps, as his own scientific researches.

Born in Germany, at Minden, Westphalia, on July 9, 1858, the young Boas studied at the universities of Heidelberg, Bonn, and Kiel. After he received his doctorate from the latter institution in 1881, he began his researches almost immediately with explorations of Baffin Land. Then came two years as docent of geography at the University of Berlin, and in 1888 he came to America—to Clark University as docent of anthropology. In 1896 he went to Columbia, where he has remained ever since, receiving honors from scientific bodies throughout the world.

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SNAKEBITE REMEDY. These prosaic little tubes contain the antivenom serum with which man can save himself from death after he is bitten by the most deadly snake.

Science Conquers Snakes

(Continued from page 350)

serum. There is a change within an hour. Mental hallucinations give way to clear thought, reflex vomiting ceases, the great swelling of arm or leg quickly subsides, and the area of discoloration fades to normal hue. At the seat of the fang wounds is an area infiltrated and broken down with the poison. Without the serum—if the victim lived—there would be a steady and dangerous necrosis, probably going to the bones and invading their surface, but this area quickly clears up, in firm and healthy tissue, leaving nothing but an indented scar to tell the story.

Such are results as the writer has observed them, in several instances where death would have occurred within a few hours, or at most a day, and in other instances where the crippling of a hand or finger would have been the result, without the injection of antivenomous serum. Such also are the results observed by Colonel M. L. Crimmins, in his extensive work of distributing and utilizing the serum along the United States-Mexican boundary.

While visiting Dr. Brazil at the Institute of Serum Therapy, at São Paulo, first-hand information was obtained of the immense economic benefit of the serum in South America. One case had been recently treated close to the Institute. Two laborers struggled with a stricken comrade. He had been bitten on the foot, which swelled enormously. He could only drag his legs along, his eyes stared from an ashen face, breathing was labored, with pause between each breath, and he began to bleed from throat, mouth and

eyes—and Dr. Brazil went on to say that this man was back at work within a week.

Such remarkable results are possible, owing to the Institute's recent discoveries in concentration of the serum. It has been found that by filtration, certain elements adding to the bulk but not indicating antitoxic power, may be removed, and among these are the so-called pseudo-globulins.

The writer returned to the United States with ampules of serum treated by such processes, and specified by Dr. Brazil as being ten times more powerful than the type which so miraculously saved the life of Head Keeper Toomey of the Zoological Park, after he had been bitten by a huge Texas rattlesnake.

U. S. To Have Serum Plant

With poisonous serpents abundantly distributed all over the United States, except the extreme northeastern portion, there has been a need, for years, of a serum-producing plant in this country. There appears to be no doubt that before the advent of inoculative treatment for rabies, that the death rate from snakebite exceeded fatalities produced by infected canines. Preventive treatment after bites of rabid dogs is generally understood and followed in this country, while the bites of deadly snakes are but little understood, and except in rare cases, are attended by treatment that is crude and shows a complete lack of knowledge of the composition of snake poisons. We have heard of instances of cauterization after a snakebite, where the direct opposite—generous drainage—should be induced. We also hear of immense doses of alcohol, which temporarily stimulates, but results in reaction and depression at the very time that the poison begins to batter at the gates of the vital organs.

General education is necessary; and we are to have it at once. Moreover, we are to have an institution, possibly two, similar to the famous plant at São Paulo. This will be a boon to a number of areas of hazard, and it will be of great interest to many thousands of hikers, campers and auto tourists, who have written to us for advice as to where serum might be obtained. Coming to this country as a courtesy, the Brazilian rattlesnake serum, efficacious for the bites of our own rattlers, copperheads and moccasins, is extremely

limited in quantity, and barely covers small areas of particular hazard.

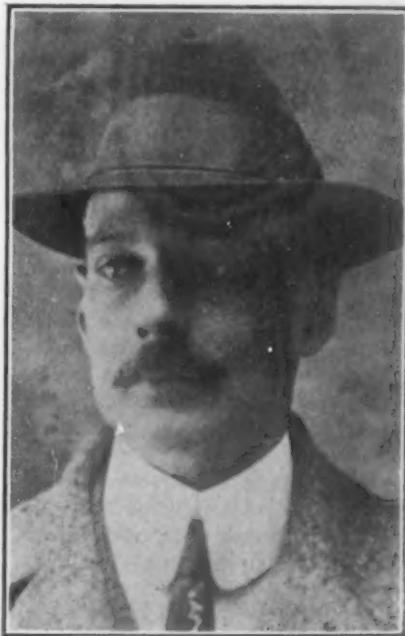
Serum for the United States will be ready in considerable quantities early this summer. It will be produced at the Antivenin Institute of America, at Glenolden, Pennsylvania, an establishment which came into being under the sponsorship of several scientific institutions, among them being Harvard University. The work of serum production is in charge of Dr. Afranio do Amaral, who was associated with Dr. Brazil in the work at São Paulo. He is a comparatively young man, of brilliant attainments, has already spent several years in the United States becoming accustomed to American methods, is a well-known authority on reptiles, and promises to produce the duplicate in this country of the Brazilian institution.

Dr. Amaral and the writer have already had a number of "poison parties" in which generous amounts of the venoms of rattlesnakes, copperheads and moccasins have been extracted for the work of immunizing horses.

Work to Cover Country

The establishment of the Institute is broader than the mere opening of the laboratory at Glenolden. Branches for the distribution of information will be located over the entire United States. The head-

(Just turn the page)



DR. RAYMOND L. DITMARS, internationally known authority on snakes and snake venom.

Science Conquers Snakes
(Continued from page 355)

quarters for information will be at the New York Zoological Park, in charge of the writer. An important branch in New England will be in charge of Dr. Thomas Barbour, of the Museum of Comparative Zoology, at Harvard University. The Zoological Society of St. Louis will be one of the mid-western branches, with Curator Perkins, of the Reptile Department, in charge. Another branch will be established in Texas, under the direction of Colonel M. L. Crimmins; another in California, under the direction of L. M. Klauber, Curator of Reptiles of the Zoological Society of San Diego. All of these branches will write and publish, throughout their respective areas, information treating with the character, habits, and occurrence of poisonous reptiles.

Another interesting development in association with this work is the establishment, in the Tela District of Honduras, by the United Fruit Company, of a "Serpentarium" similar to the snake park at São Paulo. There will be large enclosures, surrounded by moats, in which will be kept the representative deadly reptiles of Central America, and in

others will be those harmless, rat-eating species of the tropics which are of economic value on the plantations. Tela is a loading port, and tourists on Caribbean cruises will have an opportunity to visit this unique exhibition. Its main function, however, will not be as a zoological exhibit, but for the maintenance of large numbers of poisonous serpents, from which will be obtained venoms to be shipped to Dr. Amaral to produce specific serums for the tropics.

The writer understands that among the numerous plantations gathering their products for the United Fruit Company, there is an annual death rate of over two hundred workers from the bites of poisonous snakes. Thus the establishment of the serpentarium is a matter of substantial philanthropy and economic importance to Central America, which has never been able to obtain sufficient quantities of the Brazilian serum, owing to the large quantities needed south of the equator.

Perilous But Fascinating

A short time ago Mr. Douglas March visited the writer to say good-bye and sail for Tela. March is a young man on the way to a strange adventure. He is to have charge of the serpentarium, and no more unique occupation can be imagined. At the times when the plantations are being debrushed, he will follow the gangs with the machetes, on the watch for sinuous forms that glide ahead towards cover, or strike with the speed of release of a well-tempered spring. His prizes will be specimens of the fer-de-lance, the horned palm-viper, the parrot viper, the bushmaster, and slender, shining serpents marked like a stick of peppermint candy—coral snakes. These are beautiful creatures, but with a nerve-destroying venom as lethal as that of the cobras. Not only will young March be expected to keep his strange charges in good health, but he must, at frequent intervals, enter the large enclosures, hold down the head of each one individually, grasp it by the back of the neck, and allow it to bite into a glass vessel, to obtain the poison. He writes enthusiastically that everything is going well, and that he is sending us a large case of beautifully colored specimens. We well realize the care necessary in opening the case—as we are not so sure that our fairly varied stock of serums is efficacious for all of the types that come from Tela.

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SCIENCE SERVICE
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June Skies

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has gone to Fagernes, in Norway. With him is Dr. Harlan T. Stetson, of Harvard University.

In England, the coming eclipse has attracted tremendous popular interest, just as the one of January, 1925, did in the United States. It is the first eclipse that has crossed the British Isles since 1724, and the last until 1999, so a large portion of the British population will be concentrated along the path of totality for the half-minute that the eclipse will last. In Norway, it will last a few seconds longer, and the sun at the time will be higher in the sky. Both of these factors are advantageous to the astronomer, and are additional reasons for the choice of Norway.

Comet Nearby

The comet which makes such a close visit to the earth in June is really of more scientific than general interest. It is a rather small comet, as comets go, and on previous visits has never showed a tail, which most people consider one of the earmarks, or perhaps "tailmarks," of a comet. Its only interest at this time is found in the fact that it is coming so close, and will be only about 3,500,000 miles away on June 27, or about fourteen and a half times as far as the moon, and much closer than any other astronomical body ordinarily comes.

However, it is the close approach of a comet to the sun that excites it to brilliance, and when closest to that body, on June 21, it will still be nearly a hundred million miles away. At the closest position to the earth, it will be in the constellation of Aquila, near the bright star Altair, which, this month, is directly south about 3:00 a. m. With a small telescope, it will be easily visible as a faint patch of light, and may even be visible to the unaided eye, as it will be just about at the limit of brightness required for naked eye visibility, about the sixth magnitude.

The comet is a historic one, despite its small size. First discovered by a French astronomer, named Pons, in 1819, at Marseilles, it was then lost until Winnecke, a German astronomer at the University of Bonn, found a comet in 1858, which proved to be the same one. Its period, or the time between successive returns to the neighborhood of the sun, is a little over six years, and since Winnecke rediscovered it,

(Just turn the page)

PSYCHIATRY

Missing the Feeble-Minded

The pathetic picture of the unrecognized feeble-minded child, struggling along in school, with dull face and open mouth, having tonsils out, adenoids out, eyes tested, all to no avail, was presented before the recent meeting of the American Association for the Study of the Feeble-Minded, at Cincinnati, by Dr. H. H. Ramsay, superintendent of the Mississippi School and Colony for Feeble-Minded.

Medical schools give such limited courses in the brain and nervous system that doctors often do not recognize signs of inherited abnormality, Dr. Ramsay pointed out.

The physical basis of feeble-mindedness is well established, he said: "On post mortem examination, the brains of feeble-minded persons show three distinct features as compared to normal brain. First, imperfection of the cells; second, numerical deficiency of cells; third, irregular arrangement of cells.

"Furthermore, we are now certain that actual brain pathology of inherent character is translated into social pathology. As examples, there are the feeble-minded prostitute, the feeble-minded criminal, the pauper, the psychopath, and many other abnormalities due to subnormal intelligence or to an inherently unstable nervous system."

The physician cannot ignore this problem, and he has a great service to render in reducing these inherited abnormalities, Dr. Ramsay said. One scientist who studied family histories of 200 feeble-minded individuals found that 80 per cent of them were descendants of individuals with pronounced nervous disease. Syphilis is found to play an important part in producing these defectives.

"With the passing of the old order of things and new teaching, with ample clinical material at hand," said Dr. Ramsay, "the physician of the present and future should be better prepared to advise his clientele accurately concerning these varieties of defect which in the main are innate and not amenable to cure or even treatment by drugs or gland extracts. These instead are subjects for proper training, suited to their ability, or life-long care and supervision."

How a large group of girls whose minds have stayed like those of very little children are being successfully taught to dress themselves, to take care of themselves, and to make use-

(Just turn the page)

SEISMOLOGY

Quake Possibly in China

Months may elapse before details of the earthquake which was felt by seismograph instruments throughout the world on Sunday, May 22, are known, even though it was one of the most severe quakes on record and thousands were undoubtedly killed. According to Commander N. H. Heck, in charge of the earthquake investigations of the U. S. Coast and Geodetic Survey, after studying reports from seismograph observatories gathered by Science Service, the quake was about 35 degrees north latitude and 100 degrees east longitude, which places it in western China or eastern Tibet. It occurred at 5:33 P. M., eastern standard time.

This region is one that has been visited by destructive quakes in the past, for on September 16, 1920, there occurred the Kan-Su earthquake in the same region, named after the province of China in which it occurred. At this time, though the damage was severe and an estimated total of 100,000 persons were killed, it was three months before the outside world knew about it.

(Just turn the page)

ARCHAEOLOGY

Derrick Saves Totem Poles

The Dominion Government Totem Pole Preservation outfit has arrived at Skeena Crossing, B. C., with a flat car load of hoisting gear, including the huge derrick used for erecting fallen poles. This gear came from the totem pole village of Kitwanga where the government work of totem pole preservation was carried on during the past two seasons to the great interest of the tourists who are allowed to walk through the Githsan Indian village while the trains stop for water.

This year the work of totem pole preservation will be carried on at Gytseguela, a village about a mile below Skeena Crossing, where there are eighteen huge totem poles close to the river bank plainly seen from the railroad car windows for over half a mile on the opposite side of the Skeena river. The northern end of the Pacific highway is at present within four miles of Gytseguela so that automobile parties from many parts of the United States can now come close to this remarkable collection of totem poles and in a few weeks the road gang will resume work on the highway and push it on past Skeena Crossing, Gytseguela and well towards Kitwanga during the present season.

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Chinese Earthquake

(Continued from page 357)

According to Commander Heck, the quake on May 22 appears to have been at least as severe as the one in 1920. In some respects this country resembles California, for the fault lines, along which the quakes occur when the two parts of the ground slip over each other, tend to run east and west. The damage that was done by the quake may have been in Tibet, as well as in the Kan-Su province of China. Much of the damage done by quakes in this region is due to landslides, caused when the loose soil is shaken. These may also bury whole villages, which may never be heard from again.

The reports upon which Commander Heck's determination was based were gathered from the seismographic observatories of the U. S. Coast and Geodetic Survey at Cheltenham, Md., and Honolulu, T. H.; that of the U. S. Weather Bureau at Chicago; the University of California at Berkeley; Georgetown University, Washington; St. Louis University, St. Louis; Regis College, Denver, Colo.; the Dominion Observatory, Ottawa, Canada, and the Meteorological Observatory at Victoria, B. C.

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Feeble-Minded

(Continued from page 357)

full articles, so that they no longer sit about vacantly and unhappily, was described before the specialists who are trying to improve the condition of this almost hopeless and helpless class of human beings.

"The mentality of an idiot girl is so simple that one seems to be baffled by the thought of teaching her," Dr. George J. Veith of Thiells, N. Y., said in addressing the American Association for the Study of Feeble-minded. "The best type of instructor understands how these girls live, and their needs. She must possess patience to a marked degree. She must be willing to get down to the level of the idiot child and to become an actual part of that child's world."

Dr. Veith reported on the difficult enterprise of training of 139 girls whose real ages range from six to 45 years, but whose minds are all below the six year level, and some even below two years. All 139 have learned the simplest practical finger tasks of buttoning and unbuttoning clothing and tying bows. Ninety-one have learned to dress and undress themselves. The attempt was made to teach 90 of them to recognize their names in print, and 82 have succeeded in learning this, so that they can pick out their own labeled clothes and possessions.

In the occupational field, 129 of the girls learned to sew carpet rags. Forty-two learned to make Persian rugs; 24 learned to knit; 29 learned to crochet; 11 can now sew on the machine; 19 can make hook rugs, and so on with other industrial tasks.

The 30 months' training has given these social and industrial misfits something to do, and it has contributed a large collection of sweatshirts, gloves, mats, laundry bags, toweling and other articles for the use of the institution, Dr. Veith said.

"The group plays with a better spirit," he reported, "showing a kindlier feeling to each other and to those in charge, and taking a larger interest in surroundings. Not only do these girls keep themselves looking neater but they help themselves in their cottages. They are cleaner and have come out of their world of inferiority, earnestly endeavoring to imitate the brighter girls. They are less of a burden to themselves and others."

Teaching these idiot and imbecile children to use their hands has not improved their low intelligence level, Dr. Veith reported.

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Say you saw it advertised in the SCIENCE NEWS-LETTER

June Skies

(Continued from page 357)

and its present compound name was attached to it, it has been seen in 1869, 1875, 1886, 1892, 1898, 1909, 1915 and 1921. Some of its returns have been missed, because it has not approached close enough to the earth to be seen with the telescopes then in use.

The Planets in June

June also brings a better evening display of planets than we have enjoyed for many months. Most conspicuous of all is Venus which shines high in the west shortly after sunset, and is so bright that it can be seen even in the bright twilight, long before any of the other stars have appeared. As it is the brightest object in the evening sky, except for the moon, it is easily recognized. It sets below the western horizon three hours after the sun.

The other of the two planets which revolve within the orbit of the earth, Mercury, the nearest of all the members of the solar system to the sun, will also be seen for part of the month. On June 22, it will be at greatest eastern elongation, which means that it is the farthest distance east of the sun, as seen from the earth. On that day, at sunset, it will be low in the western sky, about 17 degrees, or as high as a stick 7 inches long held at arm's length, above the horizon, and a little less than that, about 15 degrees north of the point of the horizon directly west. It is too low to be shown on the maps. As the twilight lasts long at this time of year, Mercury will have set before the sky is really dark, but if one knows where to look for it, it should be picked up without difficulty in the gathering dusk. Look for it from about the 15th to the 27th.

Saturn, also, the famous ringed planet, has come into the evening sky, and is shown on the map, in the constellation of Scorpio. It is in the southeast, a little above the red star, Antares. Mars is also still in the evening sky, near Venus, but low in the west after sunset, and as it has now diminished in brightness to a par with the Pole Star, it is rather hard to see.

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In India rickets is more prevalent among high caste Hindu children who are kept indoors than among low caste children who play in the sun.

Amateur Aid for Solar Study

To the radio amateur, there may soon be added the amateur solar observer, and just as the amateur radio experimenter has been responsible for many of the great advances in wireless communication, the amateur solar observer may do a great deal in the future to aid astronomers in solving the mysteries of the sun, nearest of all stars, and the one upon which our very life depends.

Already there are numerous amateur astronomers, but they are largely concerned with the study of stars which change their light more or less periodically. However, by means of the spectrohelioscope, an instrument that can be made at a cost not exceeding that of a good radio set or a cheap automobile, activities on the sun which a few years ago were invisible to astronomers may now be watched.

The spectrohelioscope has recently been developed by Dr. George Ellery Hale, honorary director of the famous Mt. Wilson Observatory. In the last few years he has been observing the sun regularly with it from his private observatory. In an article in the English scientific magazine, *Nature*, he tells of his latest observations, and how he has been able to see large clouds of hydrogen vapor on the sun rushing into the sun spots.

Many years ago, Dr. Hale invented a somewhat similar instrument by which it is possible to photograph the sun in the light of a single wave-length, or color. As each element, when its light is analyzed by the prisms of a spectroscope, shows characteristic colors, which belong to no other element, the device makes it possible to take pictures of the sun by the light of only one element, hydrogen for example.

However, observations with the spectroheliograph, as the earlier device was called, were not always clear, Dr. Hale states. It was not possible to tell which way the clouds of hydrogen were flowing, whether into the spots, or out of them, but the direction could only be inferred. Though a series of pictures could be taken in rapid succession, he says, the critical moments at which the hydrogen was drawn into the spot were rare, and only good luck would permit a photograph to be made at the proper moment. Among the thousands of spectroheliograms of the sun made at the Mt. Wilson

Observatory, only once, and that in 1908, has such a phenomenon been recorded.

The spectrohelioscope, however, permits the observer to watch the sun, in the light of a single wavelength, and so the ebb and flow of a single element can be watched. And then, if necessary, a photograph could be made at the proper moment. With the instrument, says Dr. Hale, he has repeatedly seen these great clouds of hydrogen suddenly develop near an active sun spot, and then rise up and descend into the spot, with a speed of as much as 1,600 miles a minute.

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PSYCHOLOGY Can't Guess About Babies

If you come into a room, and find a young baby lustily howling and waving his arms and legs, can you tell with certainty whether he is registering fear, hunger, pain, or anger? If you can, you are better at interpreting a baby's emotions than psychology students, medical students, nurses, or normal school students, all of whom tried this test at the University of Chicago.

A report of the experiment, by Dr. Mandel Sherman, in the *Journal of Comparative Psychology*, shows that if young infants really do set off different arm, leg, and face signals to show their different emotions, adults are very dense at reading the signs right. Psychology students suggested 25 different emotions to fit the four types of emotion shown by the infants. The babies in the experiment were under eight days of age.

If an observer does not know why a baby is crying, he is apt to color his judgment of the baby's emotion by his own interests and experiences, Dr. Sherman finds. Young medical students, for example, leaned rather heavily toward a diagnosis of "colic" when the babies were really frightened at being dropped a little way, or angry at being held. Most of the observers were considerably more accurate in their judgments when they knew what situation had started the crying than when they were simply shown the crying infants with no clue as to the cause.

Dr. Sherman is making a series of studies on the emotional responses of infants to find out just how babies express different states of feeling.

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NATURE RAMBLINGS

By FRANK THONE



65

Mosquitoes

After the long, wet spring we have had, with rivers out of their banks almost everywhere, and ponds and lakes and swamps all well provided with water, all signs point to a bad year for mosquitoes. Hence also a bad malaria year, especially in the flooded areas, where thousands of luckless farmers and townspeople will probably have to live as refugees, or camped out under makeshift conditions on the sites of their ruined homes after the waters have partly receded.

It therefore behooves everyone to guard against mosquitoes; as a sanitary measure wherever malaria is abroad, for ordinary comfort in the fortunate localities that are free from this disease. In most kinds of warfare the most distant defence is usually the best, but against mosquitoes the last entrenchments are the surest. Screens on all windows, edges of tents tight to the ground, mosquito bar over tent flies and other openings, mosquito-nets over camp cots, backed up by spray guns loaded with any of the good insecticides now obtainable commercially—there are your best weapons and armor.

Then, still on your own premises, you can conduct your private warfare effectively by emptying all old barrels and other rain-catchers, filling up chance hollows, and clearing the premises of tin cans and broken crockery that might hold even a cupful of stagnant water. For the troublesome biters can breed in a tablespoonful of liquid. Cisterns and permanent ponds, if not screenable, should be given a little oil: the thinnest kind of a film is enough to kill the wigglers. By doing these things himself, the private citizen can render a real help to the larger-scale operations of city, county and state officials, and prove himself a civilized and practical patriot. For war has slain its thousands but malaria its tens of thousands.

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BF	Psychology.
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GB	Physical geography.
GC	Oceanology and oceanography.
GF	Anthropogeography.
GN	Anthropology. Somatology. Ethnology. Ethnography. Prehistoric archaeology.
GR	Folklore.
GT	Manners and customs.
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HC	Economic history and conditions. National production.
HD	Economic history. Agriculture and Industries.
HE	Transportation and communication.
HF	Commerce.
HM	Sociology. General.
HQ	Family. Marriage. Woman.
HV	Social pathology.
L	Education.
M	Music.
N	Fine arts.
P	Philology and linguistics.
Q	Science. General.
QA	Mathematics.
QB	Astronomy.
QC	Physics.
QD	Chemistry.
QE	Geology.
QH	Natural history.
QK	Botany.
QL	Zoology.
QM	Human anatomy.
QP	Physiology.
QR	Bacteriology.
R	Medicine. General.
S	Agriculture. General.

SB	Field crops. Horticulture. Landscape gardening. Pests and plant diseases.	450	Italian
SD	Forestry.	460	Spanish
SF	Animal culture. Veterinary medicine.	470	Latin
SH	Fish culture and fisheries.	480	Greek
SK	Hunting. Game protection.	490	Minor languages
T	Technology. General.	500	NATURAL SCIENCE—
TA	Engineering. General.	510	Mathematics
TC	Hydraulic engineering.	520	Astronomy
TD	Sanitary and municipal engineering.	530	Physics
TE	Roads and pavements.	540	Chemistry
TF	Railroads.	550	Geology
TG	Bridges and roofs.	560	Paleontology
TH	Building construction.	570	Biology
TJ	Mechanical engineering.	580	Botany
TK	Electrical engineering and industries.	590	Zoology
TL	Motor vehicles. Cycles. Aeronautics.	600	USEFUL ARTS—
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First Glances at New Books

PRINCIPLES OF SOIL MICROBIOLOGY—Selman A. Waksman—*Williams and Wilkins* (\$10). The rôle of microscopic living things in the soil has long been recognized as highly important and has evoked a huge literature, which in the nature of things has become very much scattered, so that it has been insuperably difficult for the student to be sure he has covered even a particular subdivision of the field. Professor Waksman has therefore performed a service for which all generations of men who have to do either with the soil or with the legion forms of microbiota will rise up and call him blessed. The publisher's boast, "The most exhaustive study in any language," is not an idle one. Nothing is neglected—bacteria, myxomycetes, protozoa, algae, fungi, worms, all the teeming life most of us never even think about, are examined from the points of view of systematics, physiology, ecology, chemistry, physics. There are relatively few illustrations, but these are wholly to the point; of more importance are the tabulated quantitative data and the abundant and meticulous literature references. Hereafter the soils student will reach for his Waksman as automatically as the preacher preparing for his sermon reaches for his Biblical concordance.

Science News-Letter, June 4, 1927

GENERAL BIOLOGY: LIFE AND EVOLUTION—S. J. Holmes—*Harcourt Brace*. Most text-books in this field content themselves with a chapter or two on the subject of evolution—and during the past couple of years even this has sometimes been done with a somewhat apologetic flavor. Professor Holmes boldly seizes the bull by the horns, writes every section in his book from the evolutionary point of view, and turns out a text that every teacher of beginning biology classes (except, of course, in Mississippi, Texas and Tennessee) should find it a delight to use.

Science News-Letter, June 4, 1927

THE NEW MEDICAL FOLLIES—Morris Fishbein—*Boni and Liveright* (\$2). More truths for all the world to read on cults and quackeries in general and on such live subjects as weight reduction, psychoanalysis, beauty shops and rejuvenation in particular.

Science News-Letter, June 4, 1927

THE FUNDAMENTALS OF ASTRONOMY—S. A. Mitchell and C. G. Abbot—*Van Nostrand* (\$3). The last two years have brought a veritable flood of books on astronomy, some elementary and some more advanced, but in some ways this book is the best of its class. Intended as an introductory text, it is the only one that approaches the subject from the astrophysical, rather than the geometrical, aspect. As both authors are authorities in the physical side of astronomy, the first as professor of astronomy at the University of Virginia and a leading expert on solar eclipses, and the second as director of the Astrophysical Observatory of the Smithsonian Institution, they have produced a book which is thoroughly accurate and scientific. Yet, as the book is based on Dr. Abbot's popular "Earth and the Stars," it is readable enough to be interesting to the layman who wants to learn more about the other inhabitants of the universe.

Science News-Letter, June 4, 1927

THE FERNS—F. O. Bower—*Cambridge Press*. The first volume, issued in 1923, was an exhaustive and analytical survey of the criteria of comparison within this botanical group; the second, now out, takes up the Eusporangiatae and other relatively primitive forms. Future volumes are to deal with the remaining sections. This is a work designed for the specialist, but indispensable to him. Wherever the study of ferns is taken seriously, wherever graduates and advanced undergraduates are at work in morphology, space will have to be found on the shelves for Bower.

Science News-Letter, June 4, 1927

BACKYARD EXPLORATION—Paul G. Howes—*Doubleday Page* (\$6). Not strictly backyard, for the author confesses a ten-mile radius. But a large proportion of the creatures he has studied can really be found in the average suburban back yard, and Mr. Howes has certainly demonstrated what can be done by patience and a close observation of common things. The book is freely illustrated with original photographs, all of them good, some of them astonishingly so.

Science News-Letter, June 4, 1927

FITTING DRESSES AND BLOUSES—Farmers' Bulletin No. 1530—*Government Printing Office* (10c.) A useful addition to the household library, not only for farmers' wives but for every woman and girl who attempts to make her own clothes.

Science News-Letter, June 4, 1927

PHOTOGRAPHY, ITS PRINCIPLES AND PRACTICE—C. B. Neblette—*Van Nostrand* (\$6.50). Here is a book that fills a long-felt need. Despite the importance of photography to modern science, there has been a surprising lack (in English) of detailed treatises on the subject. There have been plenty of books for the amateur snap-shooter and on special and more advanced topics. Professor Neblette, however, has produced a work that will be of value to the scientist who wishes to apply photographic methods in his own work to best advantage, and to the photographer who wants to know the "why" of his processes.

Science News-Letter, June 4, 1927

TWENTIETH CENTURY EUROPE—Preston William Slosson—*Houghton Mifflin* (\$4). A comprehensive narrative of events during the most dramatic quarter-century of the world's history, covering not only Europe but also including Asia and Africa under European influence. A volume of over 700 pages, equally adapted for the use of history classes and of individual readers who want to survey the background of the day's news. A chapter on the progress of science and invention has been contributed to the book by the Director of Science Service.

Science News-Letter, June 4, 1927

THE ESSENTIAL OILS—Horace Finomore—*Van Nostrand*. (\$20). A complete encyclopedia of everything known to date about this very important pharmaceutical group, crowded between the covers of one thick volume. The descriptions are arranged according to the botanical classification of the plant sources, and each article is followed by appropriate references to the literature. It would seem as though this volume must become a "Bible" in its particular field.

Science News-Letter, June 4, 1927

PHYSICS IN ITS RELATIONS—*Vassar College*. A symposium by such eminent scientists as Michael I. Pupin, R. A. Millikan, Henry Norris Russell, T. H. Morgan, W. R. Whitney and Frederick A. Saunders, on the significance of physics in other fields of learning.

Science News-Letter, June 4, 1927

THE ORIGIN AND DEVELOPMENT OF ARTIFICIAL LIGHT SOURCES, THE DYNAMO AND THE STEAM ENGINE—*University of Pittsburgh* (\$.75). Nine radio talks given by University of Pittsburgh professors from station KDKA.

Science News-Letter, June 4, 1927

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Anniversaries of Science

June 8, 1275—Guglielmo Saliceti completed his "Cyrurgia" or treatise on surgery, in which, for the first time, surgical diagnosis is not separated from internal medicine. He was modern in many of his observations and descriptions.

William of Saliceto (1201-1277) was, however, the greatest surgeon of the thirteenth century, and the author of a systematic work on surgery ("Cyrurgia"). Like Hugh of Lucca he had had experience on the field of battle. He described wounds of various kinds, the suturing of intestines and nerves, the treatment of fractures and dislocations. His influence tended to restore the use of the knife in surgery, though he devoted considerable space to the discussion of different methods of cauterization. Saliceti distinguished between hemorrhage from arteries and veins, but his knowledge of anatomy was, like that of all his contemporaries, very limited.

—Walter Libby: *The History of Medicine*.

June 11, 1292—Roger Bacon died. He was the earliest really modern scientist. He knew the earth was round, use of lenses (probably had a microscope), could make gunpowder, prophesied submarines, flying machines, and automobiles. He knew the literatures of Latin, Greek, Chaldaic, Hebrew and Arabic.

"But whatever is contained in the books of the Mages ought to be prohibited, for these books, though they may contain something of the truth, have so much falsity in them it is impossible to distinguish between the true and the false."

"Moreover, men who carry out their affairs according to the face of the heavens and the disposition of the constellations are at liberty to ascribe not only these figures themselves but all of their works as well, directly, to the virtue of Art and of Nature as, less directly, to the virtue of the heaven."

"I repent of having given myself so much trouble to destroy ignorance."

—Roger Bacon's Letter, *Concerning the Marvelous Power of Art and of Nature and Concerning the Nullity of Magic*.

June 14-15, 1919—Daily Mail prize of £10,000 was won by Captain Alcock and Lieut. Whitten Brown, who crossed Atlantic from Newfoundland to Clifden, Ireland, in 16 hours, 12 minutes.

Alcock and Brown's trip across the Atlantic was short but terrible. Half an hour after they left Newfoundland, a part of the wireless set gave way. They could not let a world, which was literally holding its breath, know how they fared. Nearly all the way over they were either in fog or flying between banks of fog, so that they could not see the water most of the time. A flying-machine always drifts from its course—how much, the pilot notes by watching the waves of the sea or the ground. But Alcock and Brown could not

see the water, so that, for all they knew, they were drifting away from the right course and might never reach land again. Luckily, they caught a glimpse of the sun, the moon, and a star or two, so that they could calculate their position. Most of the time they sped at a height of 4,000 feet. Flying in a fog makes it hard for a man to know whether his machine is on an even keel or not. When Alcock once swooped down to within fifty feet of the sea to get what he called his "horizon," which means his level, he found himself flying almost on his back. And he never knew it until he saw the water! To be sure, he did not fly very long in that position—only a few minutes probably. So thick was the fog that the two men never saw the sun rise. Once they climbed up to 11,000 feet and ran into hail and snow. Brown had to stand up and chop off the ice from the instruments. Think of that two miles in the air!

Alcock and Brown covered the distance of 1,960 miles between Newfoundland and Ireland in sixteen hours and twelve minutes—less than the time it takes the Twentieth Century Limited to run from New York to Chicago, which is only half the distance. The speed of the airplane was about 120 miles an hour, which is due to the fact that a following wind helped the machine along by about 25 miles an hour.

—Kaempffert: *A Popular History of American Invention*.

Science News-Letter, June 4, 1927

EDUCATION

An Educational Test

By CASSIUS J. KEYSER

Many college graduates—perhaps a majority of them—are not educated.

What is the test?

There is no criterion that may be rightly called *the* test, for there are many tests.

Though the tests are many, I will here state but one of them. In a sense it is a negative test but it has the double merit of being at once infallible and convenient. It is convenient because any one can apply it readily either to himself or to others.

The test in question in this:

Do you read books that you cannot understand easily? Books that require to be read slowly and deliberately? Books that you know are beyond your capacity to understand fully? If you do not, you are not educated; you have not the temper and habit of an educated mind; you are not a student.

Do people who fail to meet that test think that they are educated? No. Such people do not think.

—Quotation from *Mole Philosophy and Other Essays*—Dutton.

Science News-Letter, June 4, 1927

Wyoming is attempting to round up the thousands of wild horses in the state.

Glumtrap Rhyme

This poem was published in *Nature* for April 14, 1898, with the note that it is repeated by the children in the nurseries of Balnibarbi. The author explains that Balnibarbi is one of the countries visited by Gulliver; the "glumtrap" is their equivalent of the English nursery, and the babies of that fortunate land "are brought up on strictly scientific principles—as is evidenced by their knowledge in these verses."

Distant scintillating star,
Shall I tell you what you are?
Nay, for I can merely know
What you were some years ago.

For, the rays that reach me here
May have left your photosphere
Ere the fight of Waterloo—
Ere the pterodactyl flew!

Many stars have passed away
Since your ether-shaking ray
On its lengthy journey sped—
So that you, perhaps, are dead!

Smashed in some tremendous war
With another mighty star—
You and all your plants just
Scattered into cosmic dust!

Strange, if you have vanished quite,
That we still behold your light,
Playing for so long a time
Some celestial pantomime!

But, supposing all is well,
What you're made of, can I tell?
Yes, 'twill be an easy task
If my spectroscope I ask.

There—your spectrum now is spread
Down from ultra-blue to red,
Crossed by dark metallic lines,
Of your cooler layer the signs.

Hence among the starry spheres
You've arrived at middle years—
You are fairly old and ripe,
Of our solid solar type.

Ah, your sodium line is seen
Strongly shifted towards the green.
Hence you are approaching me
With a huge velocity!

But, if some celestial woe
Overtook you long ago,
And to swift destruction hurled
Life on every living world,

Did there in the fiery tide
Perish much of pomp and pride—
Many emperors and kings,
Going to do awful things?

Mighty schemes of mighty czars—
Mighty armies, glorious wars!
From the Nebula they may
Rise to curse a world some day!

—G. M. Minchin.

Science News-Letter, June 4, 1927

Summer is Nature's Own Time—

The Science News-Letter Is Therefore Pleased To Announce

SPECIAL OUT-OF-DOORS PAGES

These nature pages will be prepared by leading nature-study and outdoors experts under the supervision of the Coordinating Council on Nature Activities, an organization that brings together leading societies and institutions interested in a proper understanding of the great outdoors. The pages, full of wood lore and useful interpretation of forest, field and garden, will appear during June and August.

Other News-Letter Features Scheduled for June and July

Nature Ramblings (a weekly nature note by Dr. Frank Thone).

Star Charts of Summer Heavens (an explanation of the stars by James Stokley).

Europe's Total Eclipse of the Sun (explained and reported by Prof. S. A. Mitchell, leader of America's only expedition).

Great Events in the Science of the Past.

Science Helps Coaches to Train Winning Athletes (the first authoritative statement of the new investigations of sprinting by the famous English athlete-scientist and Nobel prize winner, Prof. A. V. Hill).

Man's Age and Evolution in the Light of New Discoveries (raising the question as to whether ancient man lived in America).

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